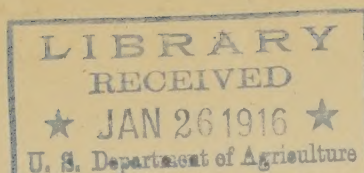


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AGRICULTURAL EDUCATION MONTHLY.

U. S. DEPARTMENT OF AGRICULTURE,
STATES RELATIONS SERVICE.

AGRICULTURAL INSTRUCTION DIVISION.

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A SIMPLE METHOD OF CATALOGUING AGRICULTURAL LITERATURE SUITABLE FOR THE SCHOOL OR HOME LIBRARY.

While the libraries of the agricultural colleges and the larger agricultural schools of this country have long made suitable provision for cataloguing and using the bulletins of this department and those of the State agricultural experiment stations, no such arrangement has been made by any considerable number of the smaller agricultural schools or the public schools. These schools do not have librarians to take care of their publications nor do many of them have suitable filing cases or even sufficient shelf room. As a result the agricultural bulletins and pamphlets which have been procured by these schools are frequently piled up in some corner, unused and unusable, the great majority of teachers in the public schools failing to appreciate the range of useful information embodied in these publications. In the hope of helping such teachers this description of a simple method of cataloguing small collections of agricultural publications has been prepared.

With the widespread interest now awakened in agricultural education teachers are having a hard time at best to procure suitable and reliable literature on all phases of agriculture for reference purposes in schools and to supplement the textbook, but it is hoped that many will have their difficulties lessened by taking advantage of this system of cataloguing, which is so simple as to require very little study and so inexpensive that it can be put into operation in any school where a few cards can be procured for the catalogue and a few shelves can be put up for the bulletins. The system is also a suitable one for filing private collections of agricultural bulletins; in fact, its great usefulness, as already demonstrated in the farm home, was what suggested its application to school conditions.

MATERIALS FOR THE CATALOGUE.

With this system only three things need to be provided before beginning the catalogue: (1) A few cards for the catalogue, (2) a box to hold the cards, and (3) cases or shelves where the bulletins can be placed on end.

1. Plain white cards and colored division cards in two colors are needed. There should be as many white cards as there are articles to be catalogued and as many colored cards as

HOW TO USE THE CATALOGUE.

Supposing now that all of the agricultural bulletins, circulars, and reports in a school library or in a farmer's private collection have been catalogued according to this plan, let us see if the catalogue makes a ready and convenient reference for students in the public school and also for farmers having a library for their own use and the use of their boys who are interested in farm work.

Bulletin 154 of the Alabama College Station reports the results of three years' feeding experiments to determine the value of soy-bean pastures and the most profitable amount of corn to use for fattening hogs on these pastures, and the question of hardening lard and meat hogs that had been thus pastured. Feeding experiments with tankage and cottonseed meal are also reported, together with a summary of Bulletin 143 of the station dealing with supplementary feeds and corn for Southern hog production. The card for this bulletin would read:

154

**CORN, SOY-BEAN PASTURE, TANKAGE, AND COTTONSEED MEAL
FOR FATTENING HOGS.**

By D. T. GRAY, J. W. RIDGWAY, and E. R. EUDALY.

1911.—Bulletin, Alabama Station.

From this title the bulletin evidently deals with farm crops, hogs, and feeds and feeding, so we should expect to find duplicate cards in each of these subdivisions of the catalogue. A student or farmer interested in looking up all available information on feeding hogs would naturally look under the subdivision "hogs" in the catalogue, and there he should find a reference to Bulletin 154 of the Alabama station; another interested in the various uses of corn or soy-beans should find the same reference under "farm crops," while still another looking up information on feeding experiments, should find this bulletin catalogued under "feeds and feeding." Catalogued in this way the bulletin would be so cross-referenced that it would serve three times as many people as it would if only one card was made for it. Further cross-reference could of course be made, and might be desirable in some cases.

Circular 11 of the New Hampshire Experiment Station points out the value of books, bulletins, and magazines, and the general agricultural press as sources of practical information for farmers, and gives a list of standard horticultural books, bulletins, and magazines. The card for this circular would read:

11

HORTICULTURAL INFORMATION: HOW TO OBTAIN IT.

By B. S. PICKETT.

1911.—Circular, New Hampshire Station.

The first word in the title of this circular would suggest putting a card for it in the catalogue division on "horticulture," but since it also contains some information of a general nature concerning the value of books and other publications, it might be well to put a duplicate card in the catalogue division entitled "miscellaneous," or better, a catalogue division on "references to literature" might be added to the scheme. A student looking for references to helpful literature on horticulture ought to be able to turn to his catalogue, find a card like that described above, and from the number 11 in the upper left-hand corner of the card go at once to the proper circular on the bulletin shelf. Thus, by turning over four or five cards, he would save the trouble of taking down and putting back at least 10 publications, supposing he were to start at No. 1 to examine the publications.

One more illustration should be sufficient to show the simplicity of this method of cataloguing and the desirability of its use in elementary and secondary schools as well as in the farm home.

The twenty-fourth annual report of the Nebraska Experiment Station contains the director's summary report and reports of the substations, and a financial statement, besides an appendix of scientific papers on a new sawfly enemy of the bull pine in Nebraska, spraying for the melon aphis, genetic correlation and spurious allelomorphism in maize, the relation of climatic factors to the water used by the corn plant, correlation studies of corn, a comparative study of the bacterial content of soils from fields of corn and alfalfa, and the effect of food on the strength, size, and composition of the bones of hogs. It is needless to say that not all of this information is of general interest. The articles, however, on corn, the melon aphis, and perhaps one or two other subjects are of sufficient interest to warrant their being catalogued. The cards for two of these articles would read as follows:

24

SPRAYING FOR THE MELON APHIS.

By M. H. SWENK.

1911.—Annual Report, Nebraska Station, pp. 35-57.

24

**THE RELATION OF CLIMATIC FACTORS TO THE WATER USED BY THE
CORN PLANT.**

By T. A. KIESSELBACH and E. G. MONTGOMERY.

1911.—Annual Report, Nebraska Station, pp. 91-107.

The first card is on a horticultural subject and should be put under "horticultural pests," while the second relates to farm crops and should be so classified. Both cards have the same number and refer to the same report, but the page references show that they are from different parts of the report and also help the student to turn at once to the desired article. These page references serve the further purpose of indicating the length of the article.

A card catalogue on this plan, when once prepared for all the agricultural publications on hand, can easily be kept up to date by simply taking a few moments to prepare cards for each publication as it is received. The saving of time to any one having to refer frequently to a miscellaneous collection of pamphlets would be great, and in the case of a school class in agriculture a catalogue is almost as essential as the publications themselves, for the publications are never used effectively without some good system of filing and cataloguing.

At the opening of each school year all new students who may have occasion to use the agricultural bulletins should be shown how to use the catalogue and how to find the publications referred to on the cards.

PUBLICATIONS OF THE U. S. DEPARTMENT OF AGRICULTURE CLASSIFIED FOR THE USE OF TEACHERS.

A large percentage of the requests that come from teachers and others to the Department of Agriculture for its publications lack definiteness of title or carry some other indication of uncertainty as to the particular information desired. Many publications are doubtless sent out that do not meet the real requirements of those who apply for them, either because of the lack of information on the part of the applicant as to the publications available or on the part of the department as to the particular character or purpose of the information sought. This division therefore prepared multigraphed lists with the design of assisting toward a more economical and intelligent use of the Government publications on agricultural topics by classifying them with reference to subjects commonly taught in the schools.

It is particularly desirable that teachers should be prepared to use these publications to the best advantage. While instructors in special subjects in the agricultural colleges of this country have long made extensive use of the bulletins of this department, it is believed that college teachers in general (outside the agricultural specialists) and a vast larger number of teachers in the public schools have not fully appreciated the range of information useful in teaching and study that is embodied in these publications. With the widespread interest now awakened in agricultural education, it is expected that many teachers will rapidly become intelligently acquainted with what the department offers that is available for school work.

Certain publications are issued annually, such as the Yearbook of the Department of Agriculture and reports of the various bureaus. Of these only the Yearbook is of popular interest, and teachers can best procure it by application to their own Congressman or United States Senator. The various volumes thus secured should be used as a permanent part of the school library. The Yearbook is always finely illustrated, often with colored plates, and contains much material that can be used in teaching a variety of subjects. Five hundred thousand Yearbooks are printed annually, and of these 470,000 are reserved for distribution by Members of Congress.

The second class of publications consists of Farmers' Bulletins, Yearbook reprints, and other popular papers. These are published in large editions for free general distribution, but the demand for the Farmers' Bulletins often exceeds the ability of the department to supply them in sufficient quantities for class use. In such cases teachers are referred to their Senators or Representatives in Congress, who are authorized by law to distribute four-fifths of the total number published.

The third class consists of a departmental series of bulletins written in popular language for selected and general distribution.

There is no list of persons who receive all the publications as issued, as this would be very wasteful and unsatisfactory. Instead, a Monthly List of Department Publications is sent regularly to all applicants, from which they can order by proper title and number any publication desired.

Avoid requesting a large list of publications on different subjects at one time or of publications the use of which is to be distributed over a long period of school work. For reasons already indicated it must be the policy of the department to limit the distribution of publications to actual present needs as nearly as possible, so that the funds available for purposes of publication can be made to benefit the largest possible number of real users. A limited number of bulletins carefully studied by the teacher or the class, or assigned to certain members for individual reports, are of much greater service than a hundred forgotten on the shelves at home or in the school library.

THE HOME VEGETABLE GARDEN—SUGGESTIONS FOR ITS UTILIZATION IN SECONDARY AGRICULTURAL INSTRUCTION.

INTRODUCTION.

The fact that most farmers do not appreciate the value of a kitchen garden has brought forth many popular bulletins upon this subject intended for the farmer. Much has also been written upon the home garden in connection with the school garden in elementary education. It is hoped that the suggestions which follow will show that the home garden may also have educational value when made a part of the agricultural instruction of secondary schools.

RELATION TO COURSE OF STUDY.

Place in agricultural courses.—Consideration of the home garden may become a part of the following courses: (1) General agriculture, (2) general horticulture, or (3) a special course in vegetable gardening. In schools which give a general course in agriculture emphasis should be placed upon the home garden because of its economic value and because many of the general principles of agriculture may be developed and applied in connection with it. In case the course in agriculture is divided into plant husbandry and animal husbandry, a garden project will serve well in the application of the principles of plant production. The time given the subject in a general course will vary with the importance of gardening in the district and the aim of the course given. In some schools but two or three lessons are devoted to the subject, while in other schools the teaching of plant production is based upon the home garden and the class work centered largely around it. In schools giving courses in horticulture of which vegetable gardening is a part, or in those giving special courses in vegetable gardening, the home garden should be given emphasis; it may well serve as a basis for teaching the principles of horticulture.

Correlation with other subjects.—In rural high schools teaching botany as a subject separate from agriculture there should be an application of botanical principles to the art of farming. A home garden gives abundant opportunity for the application of the principles of plant growth and at the same time furnishes experience and observation as a basis for inductive teaching. A study of botany should add interest to the growing of plants, and practical gardening should add interest to the study of botany. This fact is appreciated by teachers of botany who desire to make practical application of the subject. In some schools where agriculture is not taught a home garden is a popular project in connection with the course in botany.

In combating pests there is opportunity for correlation with zoology. In mixing fertilizers and sprays there is application of the principles of chemistry. In the manipulation of

implements and machines and in the management of hotbeds the principles of physics are applied. In a study of how plants grow physical and chemical as well as biological laws are involved, so that work in the garden and a study of vegetable gardening should naturally correlate with all the natural science usually taught in the high school.

In the accurate mapping of the garden and in the keeping of accounts practical mathematics will be involved. Written reports of the garden projects may be criticized by the teacher of English, or subjects having to do with the garden may be assigned as themes for compositions.

Seasonal sequence.—If the school lessons are to be based upon practical work, the garden will furnish subject matter throughout the school year. In the wintertime in the Northern States the garden should be planned, varieties studied, and preparation of the soil discussed so there may be preparation for early planting. Hotbeds and cold frames should be given attention at this season. A consideration of planting and methods of culture should come largely in the spring and methods of marketing in the late spring and fall. The summer vacation time is a season of greatest activity in the garden, hence provision should be made for supervision of the home project and for the care of the school garden during that period. In the South as in the North the work should be adapted to meet local needs. It is possible that the winter garden may be the great need of the southern community and that a winter garden will fit in better with the work of the school.

Relation to development of student.—If the subject is to appeal to the youth it must be shown that it has economic value. Elementary students may work together in a school garden, or take care of individual plats at the school or at home, because of a general interest in a social activity, but if the interest of the secondary student is to be maintained the work must show a value in dollars and cents as well as in educational training.

CLASSROOM INSTRUCTION.

Use of reference material.—The study outline which follows in connection with the discussion of the home project is suggestive of topics arranged in logical sequence for classroom discussion. A number of excellent texts on vegetable gardening have been recently published. At least one of these books should be available for reference purposes, and in connection with it a supply of the publications of the State agricultural college and the Department of Agriculture which pertain to the subject. The instructor should become familiar with the reference material that he may give definite references in connection with topics assigned. If all students are not growing the same crops, assignments on special subjects may be made.

Use of illustrative material.—The better illustrated catalogues of seedsmen will be found helpful in visualizing the study of varieties. The teacher does not have to depend upon books and charts alone in the teaching of this subject. Samples of seeds and vegetables may be brought into the classroom. The blackboard and charts should be used freely in showing garden plans, planting tables, and any information which may be tabulated or expressed in graphic form. The students should be called upon for much of this work.

FIELD TRIPS.

In many ways the best place to study gardening is in the garden, so under favorable conditions the lessons may be given in the school garden or one of the home gardens where the vegetables may be studied in different stages of growth and methods of culture noted at the same time. Students should learn to recognize the seeds of all common vegetables and the plants in their seedling form as well as in the more mature stages. The following field trips should suggest others which may have value: (1) Visit successful market gardeners for the purpose of studying methods, (2) visit dealers for the purpose of studying seeds and garden equipment, and (3) visit public markets and packing houses to study methods of packing, marketing, and

varieties of vegetables. Each trip should have a definite aim and should be planned and supervised to reach the end sought. The students should be required to take notes and make a written report of each trip.

PRACTICUMS.

Practicums in connection with the classroom instruction will afford an application of the principles learned and practice in phases of garden work. The practicums suggested may be carried on at the school or on the home farm under the direction of the teacher.

Testing seeds.—Although the students may have tested seeds in making a study of the germinating process, time may be spent profitably in securing practice in testing different kinds of seeds according to the most efficient plans. They should apply the knowledge and skill acquired to testing seed for their own gardens and can very well serve the community to advantage in testing seeds, corn and vegetable seeds in particular. Directions for testing seeds may be obtained from Farmers' Bulletin 428, Testing Farm Seed in the Home and in the Rural School.

Making a hotbed.—Each student taking care of a garden should know how to manage a hotbed. The making of a hotbed as a class practicum should enable the individual students to make successful hotbeds at home. This work may be done in cooperation with the instruction in farm mechanics where such a course is given. Directions for making a hotbed and cold frames are given in Farmers' Bulletin 255, The Home Vegetable Garden, and Farmers' Bulletin 460, Frames as a Factor in Truck Growing. The School Garden, Farmers' Bulletin 218, contains information regarding construction of hotbeds and cold frames.

Preparing and applying insecticides.—Students should know the important insect pests of garden crops and the means known for their control. Instruction for preparing and applying insecticides are given in Farmers' Bulletin 127, Important Insecticides: Directions for Their Preparation and Use.

Home mixing of fertilizers.—Where commercial fertilizers may be used with profit the students should be given practice in home mixing as well as computing formulas and working out ratios. Directions for the mixing of fertilizers will be found in Farmers' Bulletin 44, Commercial Fertilizers.

PROJECTS.

A class project.—All of the practicums suggested above and many others may be conducted at the school if the students take care of a model home garden at the school as a class project. In addition to serving as an outdoor laboratory where garden practice may be gained, such a garden serves as a demonstration to patrons, as well as students, of the home garden. The farmers of the community may be in particular need of such a demonstration. Such a plan gives a definite purpose to the school garden, making it fit better the needs of high school instruction. The more nearly the plot approaches the ideal in size, shape, location, and type of soil the better it will serve for demonstration purposes. There may be factors which limit its value as a demonstration but which do not interfere with its utility for practice work. In one school which conducted such a garden it served as a means of introducing varieties new to the community. The vegetables produced were used largely by the home economics department of the school. It may be difficult for some schools to provide care for the garden during the summer. This problem was met in a school recently visited by assigning the care of the school garden to a boy who could secure no land for a home project. The boy was paid by the hour from the profits of the garden.

The work in the school garden should have a definite relation to the classroom instruction and the home projects. Students will be better able to plan their own gardens if they have taken part in the planning of the school garden. It will be likewise with all garden operations; the

work at the school will serve as a guide to the work at home, although there will be modifications in adapting the practice to meet home conditions.

The home project.—If possible, each student should take care of a garden at home on his own account. The home garden work should have a definite relation to the instruction at the school. There should be cooperation between the teacher and the student and his parents. It may be well to draw up a written agreement between the parties interested. Even though the chief aim in growing vegetables may be to supply the home kitchen, an accurate record should be kept in detail of time spent, expenditures, and receipts. If the student pays a rental upon the land and receives a fair price or credit for all products furnished the home it will aid in his development in the business side of farming. Every effort should be made to make the project a profitable one when judged upon a cash basis. To have the greatest educational value the project should have supervision throughout the growing season. The person having charge of the class instruction should prove the best supervisor. As not all teachers of agriculture are employed for the summer months it may be necessary to leave the supervision to the parents or others who may be interested. Each student should make a written report of his project.

In connection with the home projects a school exhibit of garden products will be a means of stimulating interest with both students and patrons. If prizes can be secured from school patrons or merchants they will stimulate interest. Educational value will be added to the exhibit if the students are trained for competitive judging of products.

The following list of questions may be used in whole or in part as a guide in a study of the subject and thus aid in the formulation of a working plan of the project.

STUDY OUTLINE FOR HOME GARDEN PROJECT.

- I. Shall I take care of a vegetable garden at home as my project?
 1. Can I make arrangements to take hold of the garden on my own account?
 2. Is there a plat of land at home suitable for garden purposes?
 3. Have I sufficient interest in gardening to make a success of such a project?
- II. What shall be my aim in growing vegetables?
 1. Will I be able to supply our home kitchen with all the vegetables needed?
 2. Have I sufficient land and time to grow a surplus to sell?
 3. Is there a market for the sale of my surplus at a profit?
- III. Can I plan my garden so as to secure the best results?
 1. How large shall the garden be for my purpose?
 2. Shall I cultivate mostly with a horse or by hand?
 3. What should be the shape of the plat for the most economical tillage when horses are used?
 4. What location will be the most convenient and satisfactory from other points of view?
 5. Can the soil be made suitable for a garden?
 6. Is there good drainage and protection from wind?
 7. Will I need a fence to protect my garden?
 8. What factors will determine the space devoted to each crop?
 9. What factors will determine the position of each crop in the garden?
 10. Have I a map drawn accurately to scale to aid me in my planting?
 11. Have I provided for a proper rotation of crops?
- IV. Can I secure the seed that will give the best results?
 1. Am I familiar with all common garden seeds?
 2. Do I know which varieties are best suited to my needs?
 3. What use may I make of a good seed catalogue?
 4. Shall I buy seeds in packages or in bulk?
 5. Why shall I buy the best seeds obtainable?
 6. How long do various garden seeds retain their viability?
 7. Which seeds will I need to test?

8. Can I make a reliable germination test?
 9. How early must I secure my seeds?
 10. Shall I plan to save any of my own seeds for planting next year?
 11. Do I understand any of the methods used in producing good garden seed?
 12. What crops will I start by other methods than the planting of seed?
 13. Will it pay me to buy plants I may need or raise them myself?
 14. Have I determined accurately how much seed of each kind I shall need?
- V. Can I secure such strong, healthy plants as may be required for my garden?
1. Which crops require a longer season than that afforded out of doors in this climate?
 2. Do I wish to do any forcing to secure early vegetables?
 3. If I decide to propagate my plants, may I not sell the surplus at a profit?
 4. Can I make and manage hotbeds and cold frames for the production of plants and for forcing?
 5. What use shall I make of seed beds and flats in producing plants?
 6. Have I planned a compost heap and arranged for sand to make soil necessary for beds and flats?
 7. May I use berry boxes, flower pots, and other devices to advantage in producing plants?
 8. What plants are benefited by transplanting, or "pricking off?"
 9. How does transplanting benefit the plant?
 10. When shall I plant various seeds in the propagating beds?
 11. What is the meaning and value of "hardening off?"
- VI. Can I prepare my land properly for planting?
1. What implements and tools will I have need for?
 2. Have I made a study of garden equipment at the dealers and from catalogues?
 3. Does the soil need fertilizing?
 4. How shall I increase its fertility?
 5. In what condition should barnyard manure be for garden use?
 6. When and how shall I apply it?
 7. What use may I make of green manures?
 8. Does my garden need a cover crop during the winter?
 9. Does my soil need lime?
 10. How can I determine the need of lime?
 11. To what extent shall I use commercial fertilizer?
 12. Can I determine what fertilizers to use and mix and apply them properly?
 13. What relation is there between time of plowing and kind of soil?
 14. At what time will it be best to plow my land?
 15. When and how shall I smooth and pulverize the soil for planting?
- VII. Do I understand how to plant my garden?
1. At what time should the various seeds and plants be planted?
 2. With what vegetables shall I plan for a succession of crops?
 3. Will it pay to grow any two crops together?
 4. Which seeds shall I plant in beds? In hills? In drills?
 5. What shall be the rate of seeding for each crop?
 6. Which seeds will be benefited by soaking?
 7. Can I use a hand drill upon my land?
 8. Will it pay me to buy a drill?
 9. How shall I secure best results in transplanting from the seed beds?
 10. What protection may transplanted plants need at first?
 11. Will any of the plants or seeds need special preparation of the seed bed?
 12. Will the same preparation of the bed serve for onion or lettuce seed as for potatoes or large seeds in hills?
 13. Am I to plant celery or any such vegetable which will need trenching or other special preparation?
- VIII. Can I give my garden proper care?
1. For what reasons, other than the control of weeds must I cultivate?
 2. What methods of tillage will be most efficient and economical?
 3. Can I handle a horse and cultivator skillfully in my garden?
 4. Can I use a wheel hoe and hand tools in an expert manner?
 5. Is irrigation essential? Can I apply it with profit?
 6. Do I understand the culture needed by each of the crops I am growing?
 7. Can I practice the thinning, staking, training, and other special operations essential with some crops?

IX. Do I understand the control of pests?

1. Have I made proper provision for keeping chickens, pigs, and other farm animals out of the garden?
2. Do I know the pernicious weeds of the district which I must guard against in a particular way?
3. What kind of spray should I use for insects like plant lice which have sucking mouth parts?
4. What kind of spray should I use for insects like the potato beetle which have biting mouth parts?
5. Are there any plant diseases which I must guard against?
6. Do I understand how to mix and apply spray materials for insect pests and plant diseases?
7. Why will methods other than spraying be necessary for the control of pests of some vegetable crops?
8. Do I know the methods of control of the most common garden pests of my district?
9. Will it pay me to buy a spray outfit?
10. What kind of a spray outfit will be best suited to my needs?

X. Can I harvest and market my surplus crop in a satisfactory manner?

1. To whom will I sell my vegetables?
2. Do I understand the particular demands of the market which will buy my produce?
3. May I not learn something from market gardeners as to packages and packing, methods of keeping vegetables fresh, and methods of selling?
4. Will it not be possible for me to begin to build up a retail trade with nearby consumers?
5. Is it possible to cooperate with other students growing vegetables in establishing a school market?

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 Onion Culture. U. S. Dept. Agr. Farmers' Bul. 354 (1909).
 The Potato as a Truck Crop. U. S. Dept. Agr. Farmers' Bul. 407 (1910).
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RECENT DEPARTMENT PUBLICATIONS OF INTEREST TO TEACHERS OF AGRICULTURE.

- The Use of Land in Teaching Agriculture in Secondary Schools. U. S. Dept. Agr. Bul. 213 (1915).
 Correlating Agriculture with the Public School Subjects in the Northern States. U. S. Dept. Agr. Bul. 281 (1915).
 Illustrated Lecture on the Production of Poultry and Eggs on the Farm. U. S. Dept. Agr. States Relations Serv. Syllabus 17 (1915).
 List of Titles of Farmers' Bulletins. Classified by Subjects (1915).
 List of Publications Issued Since July 1, 1913. (Rev. to July 1, 1915).
 List of Farmers' Bulletins including 701, issued Nov. 1, 1915.
 Exercises with Plants and Animals for Southern Rural Schools. U. S. Dept. Agr. Bul. 305 (1915).
 Copies of any of the publications listed above may be obtained free upon application to the Division of Publications of the U. S. Department of Agriculture, Washington, D. C., as long as the department's supply lasts.

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